

WHAT IS CLAIMED IS:

1. An isolated T cell expressing a T cell receptor specific for an MHC-peptide complex comprising a first housekeeping epitope, wherein the housekeeping epitope is derived from a first antigen associated with a first target cell.

5 2. A T cell clone comprising the T cell of claim 1.

3. A polyclonal population of T cells comprising the T cell of claim 1.

4. The T cell of claim 1 produced by an in vitro immunization.

5. The T cell of claim 1 isolated from an immunized animal.

10 6. A method of making an adoptive immunotherapeutic, comprising:  
combining the T cell of any of claims 1-5 with a pharmaceutically acceptable adjuvant, carrier, diluent, or excipient.

7. The method of claim 6 wherein the T cell is originally obtained from a donor.

8. The method of claim 7 wherein the donor is an intended recipient of the immunotherapeutic.

15 9. The method of claim 7 wherein the donor is immunologically naïve with respect to the first antigen.

10. The method of claim 7 wherein the donor was previously exposed to the first antigen.

20 11. The method of claim 7 wherein the donor is vaccinated with the housekeeping epitope prior to donation.

12. The method of claim 6 further comprising the step of culturing the T cell in vitro.

13. The method of claim 12 wherein the T cell is stimulated to grow by exposure to the MHC-peptide complex.

25 14. The method of claim 12 wherein the T cell is stimulated to grow by exposure to cytokines.

15. The method of claim 12 wherein the culture further comprises a pAPC, an adjuvant, or a combination thereof.

16. The method of claim 15 wherein the pAPC is a dendritic cell.

30 17. The method of claim 15 wherein the adjuvant is selected from the group consisting of GM-CSF, G-CSF, IL-2, IL-12, BCG, tetanus toxoid, osteopontin/ETA-1, CD40 ligand and a CTLA-4 blockade agent.

18. Use of the T cell of any of claims 1-5 in the manufacture of a medicament for use in adoptive immunotherapy.

19. A method of treating an illness comprising administering to a recipient the T cell of any of claims 1-5.

20. A method of treating an illness comprising administering to a recipient the immunotherapeutic of claim 6.

21. An epitope cluster, the cluster being derived from an antigen associated with a target, the cluster comprising or encoding at least two sequences having a known or predicted affinity for an MHC receptor peptide binding cleft, wherein the cluster is a fragment of the antigen, wherein the cluster has the structure:



where:

X is any amino acid naturally occurring in protein sequence;

Xa and X(|b|-1) are strings of such amino acids of length 'a' and '|b|-1', respectively,

a indicates the number of amino acids between P2<sub>1</sub> and P2<sub>N</sub>, and (|b|-1) represents the number of amino acids between P2<sub>N</sub> and PΩ<sub>1</sub>;

P2<sub>1</sub> is a first primary anchor and second residue of a first epitope;

P2<sub>N</sub> is a first primary anchor and second residue of an Nth epitope;

PΩ<sub>1</sub> is a last primary anchor and C-terminal residue of the first epitope; and

PΩ<sub>N</sub> is a last primary anchor and C-terminal residue of the Nth epitope;

$2 \leq N \leq N_c$ , N indicating the Nth epitope of the cluster and N<sub>c</sub> the total number of epitopes in the cluster;

a<sub>N</sub> and b<sub>N</sub> defining the positional relationship between the 1<sup>st</sup> and Nth epitope.

22. The cluster of claim 21 wherein  $(N_c/L_c) > (N_p/L_p)$ , the cluster and antigen each having a length, where L<sub>c</sub> is the length of the cluster, L<sub>p</sub> is the length of the antigen, and N<sub>p</sub> is the total number of epitopes in the antigen.

23. An isolated polypeptide comprising the epitope cluster of claim 21, wherein the amino acid sequence consists of not more than about 80% of the amino acid sequence of the antigen.

24. A vaccine or immunotherapeutic product comprising the polypeptide of claim 23.

25. An isolated polynucleotide encoding the polypeptide of claim 23.

26. A vaccine or immunotherapeutic product comprising the polynucleotide of claim 25.
27. The polynucleotide of claim 25, wherein the polynucleotide is DNA.
28. The polynucleotide of claim 25, wherein the polynucleotide is RNA.